Support Document

For the Air Operating Permit Issued to

Alcoa Wenatchee Works
6200 Malaga/Alcoa Hwy
Malaga, WA 98828-9728

by

State of Washington
Department of Ecology
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Introduction

This Operating Permit Support Document fulfills the operating permit rule "Statement of Basis" requirement and explains particular portions of the air operating permit for Alcoa Wenatchee Works, a primary aluminum smelter, located near Malaga, WA.

This document is not part of the air operating permit for Alcoa Wenatchee Works. Nothing in this document is enforceable against the permittee, unless otherwise made enforceable by permit or order.

Statement of Basis

When the Department of Ecology issues a draft operating permit, it is required to provide a statement that sets forth the legal and factual basis for the draft permit conditions, including references to the applicable statutory or regulatory provisions. [WAC 173-401-700(8).]

Facility and Process Descriptions

Alcoa, Wenatchee Works is capable of producing 243,000 tons per year of primary aluminum that is sold as aluminum foundry ingot, pig or sow. In July of 2001, the smelter was temporarily curtailed due in part to high electrical energy costs.

The process of aluminum reduction requires the electrolytic decomposition of alumina into two chemical components (Hall-Heroult process) which are metallic aluminum and gaseous oxygen. In order to accomplish this, alumina must be brought into a liquid phase allowing electrical direct current to pass through it. The process uses cryolite, a fluorinated compound of sodium and aluminum, which melts at approximately $1000^{o}C$. Cryolite has the capability, in the molten state, to hold up to about 8% alumina in solution. Molten aluminum, which is released during the electrolysis, has a slightly higher specific gravity than molten cryolite at the cell operating temperature, and therefore settles to the bottom of the cell forming a molten aluminum metal pad. The electrolytic cell consists of a steel shell lined with insulating materials and having an electrically conductive bottom made of carbon connected to the negative polarity of the power source. Suspended from above and immersed into the cryolite-alumina melt are carbon anodes connected to the positive side of the electric cell. When the electric current flows from the anode to the cathode, alumina is split into metallic aluminum which spreads over the cell bottom and into oxygen which evolves at the inner surface of the carbon anode. The oxygen burns and thereby releases a blend of gasses, primarily carbon dioxide, carbon monoxide, and some sulfur dioxide. The generation of sulfur dioxide is due to the sulfur content of the anode material. Hydrogen fluoride also evolves from the cryolite bath due to the high operating temperatures of the cells and the presence of moisture in the alumina.

For the production of aluminum, there are four basic cell designs. Two are designated as "prebake" and two as "Soderberg". The Alcoa, Inc. smelter at Wenatchee operates center-worked prebake (CWPB) cells. Prebake cells utilize carbon anodes, made from petroleum coke and coal tar pitch, which have been pre-formed into blocks, baked, and secured onto copper rods prior to being introduced into a cell. Pressing, baking and rodding take place on-site in the green carbon, carbon baking, and anode rodding processes respectively. In center-worked pots, the crust overlying the molten bath is broken and ore is fed by means of a puncher-feeder device located along the cell's centerline between the two rows of anodes. The individual cells are arranged in "potlines" which are rows of cells connected electrically in series.

Air pollution control systems employed at Alcoa include the following:

> For potlines, primary emission control systems capture pot fumes. The systems consist of hoods and movable shields around each pot, and a system of ducts and fans which draw the fume from each pot to a centralized treatment system. The treatment system consists of two types of alumina dry scrubbers (referred to as either A-398 fluidized bed or alumina injection system) which use alumina to react with and remove hydrogen fluoride in the gas stream. The resulting aluminum fluoride is removed, along with other particulate matter, by a system of fabric filter containing baghouses prior to venting the treated gasses to the atmosphere. The aluminum fluoride particulate is recycled in the potroom process.
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> For anode bake ovens, a dry alumina scrubber system, with fluidized bed alumina reactors and baghouses (A-446), treats bake oven gasses in a fashion similar to the A-398 system described above. Bake oven gasses consist of combustion products from natural gas and from volatile matter that is driven off the baking anodes and burned in the ovens, particulate matter from the packing coke surrounding the baking anodes, and fluoride present in spent anodes (anodes removed from the pot cells are crushed and returned to the anode mix). The alumina used in the scrubber is recycled as feedstock in the potrooms.
>
> For the green mill, a dry coke injection scrubber system (Procedair) is used for collecting and treating organic vapors and particulates in the carbon plant. In the green mill, petroleum coke and coal tar pitch are heated, mixed and pressed into anodes. Carbon particles and organic vapors are generated by these processes. The coke scrubber adsorbs volatile material onto calcined petroleum coke which is injected into the ductwork and waste gas streams, and a baghouse captures the resulting particles. The coke fines and adsorbed organic vapors collected by the baghouse are recycled back into the anode forming process.
>
> Numerous ancillary processes in the plant are equipped with dust collectors.
>
> In addition to physical control systems, operating practices and maintenance are important factors in emissions, especially in the potrooms, where pollutants not captured by the primary emission system are released without treatment through roof vents.

The potroom, anode baking and green mill gas treatment systems are all in compliance with and meet the Primary MACT and applicable state requirements.

Periodic Monitoring

EPA periodic monitoring guidance lists the following factors to be considered in arriving at appropriate periodic monitoring methodology. These factors were considered when monitoring, recordkeeping or reporting requirements were not specified in the underlying applicable requirement.

1. Likelihood of violating the applicable requirement (i.e. margin of compliance): When considering this criterion, Ecology evaluated available source test data (Appendix C) and the operation and maintenance procedures currently in place at the Alcoa Wenatchee Works. When the unit consistently performs well below the standard and the facility has a good O & M history, periodic monitoring may be less frequent or may rely on preventative measures (see functional integrity discussion in B) below.

2. Necessity of add-on controls for the unit to meet the emission limit: This criterion allows for the consideration of relative risk in the determination of appropriate periodic monitoring. Those sources that present the largest risk to the environment in the event of a failure of add-on controls, require frequent source testing as well as continuous evaluation of surrogate performance measures and O & M measures. Also considered are the presence of precedures or processes that shut down the unit if the control systems are not operating

3. Variability of emissions from the unit over time: Units which perform consistently require less frequent source testing than those where emissions vary widely

4. The type of monitoring, process, maintenance, or control equipment data already available for the emission unit: Careful consideration is given to the type of control device in use and the demonstrated ability of the company to operate and maintain the device effectively. Control devices such as baghouses can be monitored visually and still provide a high degree of certainty that the unit is functioning appropriately. Therefore source testing can be done less frequently if the company has a history of compliance with operation and maintenance requirements. The addition of functional integrity inspections for all units covered by the AOP requires weekly visual checks of the control equipment and follow-up corrective action whenever visible emissions, leaks in the duct work, excess vibration, inappropriate pressure drop are observed. This requirement focuses on early detection and prevention of problems.

5. Technical and economic considerations associated with the range of possible monitoring methods: Ecology considered the cost versus the benefit of source testing, including, for many sources, the cost of installation of access ports. For a number of small baghouses at the Alcoa Wenatchee Works, the following cost factors weighed against the inclusion of periodic source testing;
   - Routine source testing and installation of access to these units would cost an estimated total of more than $600,000 over the 5-year permit.
   - Source testing produces very few compliance data points; inspection/correction and parametric monitoring assure much closer attention and yield much more frequent and useful data.
   - For very small units, the added cost of this source testing is not justified when compared to the relative environmental risk if the unit is actually not meeting standards. For the largest units, where the environmental risk of not meeting the standard is much larger (in terms of mass or concentration), periodic stack testing is required.
   - Once the technology is installed, good O & M becomes the most crucial component of ongoing compliance with the limits.
   - Even without routine source testing, Ecology retains the authority to require source testing on a case-by-case basis.

Comments on Specific Permit Conditions

A) Aluminum Plant Emission Standards:

All aluminum plants are required to meet the emission standards of WAC 173-415-030 and -060. WAC 173-415-030 states that "specific emission standards listed in this chapter will take precedence over the general emission standards of chapter 173-400 WAC. The requirements of Condition I.1 for visible emissions, Condition I.3 for fugitive emissions and Conditions I.6 and I.7 for SO_2, take precedence over the requirements of WAC 173-400-040(1), WAC 173-400-040(3)(a) and WAC 173-400-040(6), respectively.

B) Facility Wide Requirement Number I.11. Plant-wide Operation and Maintenance:

WAC 173-415-030(6) requires aluminum plants to maintain the facility and operate and maintain air pollution control equipment consistent with good air pollution control practice. Determination of whether acceptable operating and maintenance procedures are being used will be based on information such as, but not limited to, monitoring results, the presence of visible emissions, review of operating and maintenance procedures, and inspection of the source.

Alcoa Wenatchee Works has a systematic operation and maintenance (O & M) program in place that has consistently produced good results, as evidenced by low emissions and satisfactory findings during regulatory inspections. The program consists of inspections of dust collectors in each work area, with inspection records maintained; a preventive maintenance program, with records kept; and corrective action initiated promptly.

In addition to these broad O & M requirements, this permit includes a requirement to visually inspect all baghouses on a weekly basis. This weekly functional integrity inspection includes a check for visible emissions, leaks in ductwork and housing, excessive vibrations, pressure drop, and sight glass readings when available. (Currently, all baghouses covered by this AOP have had sightglass apparatus installed). In this permit, functional integrity inspections are used as an indicator of compliance with particulate limits, opacity and O & M requirements for baghouses. Baghouses that are properly operated and maintained produce no visible emissions and easily meet a grain loading standard of 0.005 gr/dscf. Traditionally, O & M compliance has been demonstrated through observation of visible emissions and routine maintenance activities. Weekly inspection and documentation of additional operational conditions improves the company's ability to identify and correct problems long before an emission standard is violated. Because of this, the company will be required to invest in corrective action earlier than it would if the permit relied solely on visible emission observation or stack testing to demonstrate compliance. Corrective action will be initiated whenever visible emissions (or other findings from the functional integrity inspection, such as significant changes in site glass readings or excess vibration) are observed. Records of inspections and corrective actions will be maintained. In addition, stack tests for particulate matter are also required of the largest baghouses.

Some visible emissions may be observed from baghouses during routine cleaning cycles. These emissions are of short duration and are not expected to exceed the most stringent opacity limits. These low intensity short term emissions are considered to be normal operations and are not subject to the opacity and particulate permit requirements to initiate corrective action when visible emissions are observed.

Additional potroom operation & maintenance is described in H) below.

C) Opacity Permit Conditions:

For dust collector systems with baghouses, both the facility-wide O&M and functional integrity inspection requirements described above apply. As described above, baghouses which are properly maintained easily meet the opacity limits. The requirements for corrective action when visible emissions are observed are a more effective compliance strategy than occasional opacity readings. Therefore, no routine opacity monitoring is proposed, although Ecology retains the ability to require opacity readings upon request. Problems with operating practices are enforceable through the general requirement to operate and maintain facilities in a manner consistent with good air pollution control practice and through the functional integrity requirements.

For emission units without control devices that may produce visible emissions (e.g. potroom roof vents), routine opacity readings using the approved method (EPA Method 9) are impractical due to the configuration of the vents, the absense of accessible locations with appropriate viewing angle, and/or effects of weather. Opacity levels from these sources are generally minimal when good operation and maintenance practices are being used. These practices are covered by O & M conditions (see H below) and Alcoa Wenatchee Works has historically operated these sources consistent with good air pollution control practice.

D) Compliance with Particulate Matter Requirements:

Condition A.5. The particulate emissions from the dry coke scrubber on the green mill are limited to 0.005 gr/dscf. Test results show emissions to be 1/10 of the allowable and total less than 1 T/yr. A source test is required once every 5 years and upon Ecology's request. Ecology determined that more frequent stack testing is not necessary to evaluate compliance based on the margin of compliance, low variability of the test results, and the weekly inspection requirement described in B) above.

Condition A.9. The particulate emissions from the coke handling (DC2) dust collector are limited to 0.1 gr/dscf. There are no test results for this unit. Ecology assumed that 0.005 gr/dscf is easily achievable and that the unit is in continuous operation. Under these assumptions, the unit, while still a very small source, would emit more than 0.75 tons/year (the IEU threshold). In addition, the design of the baghouse is similar to other units where source tests have demonstrated that 0.005 gr/dscf is easily achievable. A source test is required once every five years and upon Ecology's request. More frequent source testing is not necessary due to the small size of the source, the requirement for weekly inspections and the history of good operation and maintenance at the Alcoa facility.

Condition B.1. Anode bake oven gasses emitted from the control system are subject to the 0.1 gr/dscf standard contained in WAC 173-400-050 (1). Three source tests are required per year, consistent with the schedule and methods for MACT testing for total fluoride (TF) and particulate organic matter (POM). Test results show that particulate emissions are less than 1 % of the limit. Periodic monitoring per B), above, also applies.

Condition C.1 and C.3. The butt crusher baghouse and the butt blast baghouse are limited to 0.005 gr/dscf. Test results show emissions to be less than 1/10 of the allowable limit and total less than 0.5 T/yr combined if the units are in use 24 hours/day, 7 days/week. No periodic source testing is required for these baghouses because of their small size and very low emission rates. Weekly functional integrity inspections are sufficient to demonstrate compliance with these conditions.

Condition C.5. The particulate emissions from the anode cleaning equipment baghouse are limited to 0.005 gr/dscf. Test results show emissions to be less than 1/10 of the allowable limit and total less than 1 T/yr. A source test is required once every 5 years and upon Ecology's request. Ecology determined that more frequent stack testing is not necessary to evaluate compliance based on the margin of compliance, the low variability of the test results, and the weekly inspection requirement described in B) above.

Condition C.8. The particulate emissions from the Lectromelt baghouse are limited to 0.005 gr/dscf. Test results show average particulate emissions from this unit are 82% of the standard. Average actual emissions from the Lectromelt baghouse are less than 1 T/year and maximum emissions if the unit is in use 24 hours/day, 7 days/week would be about 1.1 T/year. No periodic source testing is required for this baghouse because it is a small unit, especially when compared to the emissions from the potroom. Weekly functional integrity inspections are sufficient to demonstrate compliance with this condition.

Condition D.1. Potline operations are covered by a particulate matter standard of 15 pounds per ton of aluminum produced, found in WAC 173-415-030(2). Compliance is determined by adding particulate levels determined through source tests conducted on the primary control systems to those determined through testing at the potroom roof monitors. Quarterly source tests are conducted for the primary control system. Method 14 equipment has been installed in Rooms 6, 18 and Room 20. These rooms are representative of all potrooms at the facility. Monthly particulate sampling of the roof monitor is conducted in all operating rooms with Method 14 installed. The facility-wide and potroom O&M requirements require periodic monitoring. The facility routinely operates well below the 15#/T limit and could not exceed that particulate limit when complying with the TF standard in Condition D.15. Test results for the grain loading standard in the potline 5 primary control system are consistently below the 0.005 limit (60% of the standard at 0.0032)

Condition D.3. The particulate emissions from the cruce cleaning facility are limited to 0.005 gr/dscf. Test results show emissions to be less than 1/10 of the allowable, and total less than 1/2 T/yr. A source test is required once every 5 years, and upon Ecology's request. Ecology determined that more frequent stack testing is not necessary to evaluate compliance based on the margin of compliance, the test results and the weekly inspections described in B) above.

Condition D.5. Particulate emissions from the Potline 5 primary control system baghouse are limited to 0.005 gr/dscf. Test results show emissions to be consistently less than the standard (averaging 0.0032 gr/dscf). Ecology considered the size of the source, the variability of the data and the margin of compliance and determined that frequent (quarterly) monitoring is necessary. Weekly functional integrity inspections are also required.

Condition E.1. The particulate emissions from the spent potliner (SPL) processing baghouse are limited to 0.005 gr/dscf. Test results show emissions to be about 1/10 of the allowable, and total less than 1/2 T/yr. A source test is required once every 5 years, and upon Ecology's request. Ecology determined that more frequent stack testing is not necessary to evaluate compliance based on the margin of compliance, the test results and the weekly inspections described in B) above.

Condition F.1. Particulate emissions from Boiler 1 and 2 are limited to 0.1 gr/dscf. There are no test results for this unit nor any flow data. Emission estimates are based on natural gas use and EPA published emission factors for small industrial boilers (AP-42, Compilation of Air Pollutant Emission Factors). Estimated emissions of 2.4 tons PM/year are conservative and more likely to be about 1T/year because the boilers are used only in the winter. No source testing is required, however, the permittee is required to monitor the usage of natural gas and to annually recalculate emissions using the above mentioned emission factors. In addition, the permittee must conduct a weekly inspection of the boiler house.

Condition G.1. Ingot plant stacks 1,2,3,4,11 and 12 are limited to 0.1 gr/dscf. There are not test results for these units nor any flow data. Emission estimates are based on natural gas use and EPA published emission factors for small industrial boilers (AP-42, Compilation of Air Pollutant Emission Factors). Estimated emissions of less than 1 ton PM/year are conservative. No source testing is required because the Secondary MACT requirements (Condition G.3), for particulate, are more stringent. Nevertheless, the permittee is still required to conduct a weekly functional integrity inspection of the ingot plant.

Condition H.5 and H.7. The particulate emissions for the alumina railcar unloading dust collector and the bath crusher dust collector are limited to 0.1 gr/dscf. There are no test results for these units. Alcoa uses the same type cloth bag in all it's baghouses. All of the baghouses throughout the plant handle similar materials. Therefore, Ecology assumed that 0.005 gr/dscf was easily achievable and that these units would be in continuous operation. Under these assumptions, these units, while still very small sources, would emit more than 0.75 tons/year each (the IEU threshold). Because both units have a fairly high flow, a source test is required once every five years and upon Ecology's request. More frequent source testing is not necessary due to the low level of likely emissions from these sources, the requirement for weekly inspections and the history of good operation and maintenance at the Alcoa facility.

Small Baghouse Units

Monitoring requirements for other baghouse units include the O&M and functional integrity requirements described above.

Routine source testing of units OH-6, OH-8, OH-15 and OH-30 (Conditions H 9, H.11, H.13 and H.15) is not proposed. The material handled by these baghouses is alumina and Alcoa uses the same bag material in all units. Similar performance is expected from baghouses with similar characteristics and proper O&M. Data from the source tests that have been conducted show emissions below any allowable limits.

E) Conditions I.6 and I.7. SO_2 Permit Conditions:

Chapter 173-415 WAC limits sulfur dioxide emissions from aluminum smelters to 60 lb per ton of aluminum produced on a monthly maximum basis, and also limits emissions to no more than 1,000 ppm SO_2. Smelters presently control SO_2 emissions by limiting sulfur content in raw materials, particularly petroleum coke. The permit requires Alcoa Wenatchee Works to determine SO_2 emissions by mass balance calculation or alternatively by source testing. The equation used for the mass balance calculation to determine compliance with the 60 lb SO_2/ton Al limit is as follows:

$$SO_2/\text{ton Al} = (\Sigma C x 0.9 S_C + \Sigma P x S_P + \Sigma G x S_g) \text{ x } 40 / \text{Al}$$

where C, P, and G are the coke, pitch, and fuel oil usage during the month from each shipment, in tons; S_C, S_P, and S_g are the sulfur concentration of each shipment of coke, pitch or natural gas respectively, expressed as a percentage; and Al is the aluminum production for the month.

The factor of 40 derives from converting tons of raw materials to pounds (2,000 lbs/ton), converting the percentage of sulfur in raw materials to a decimal fraction (100), and converting the weight of sulfur to the weight of SO_2 (1 lb sulfur combines to make 2 lbs SO_2). 2000/100 X 2 = 40

Using a worst-case analysis, Ecology determined that Alcoa Wenatchee Works would be incapable of violating the 1,000 ppm SO_2 standard, with the possible exception of an extreme upset condition. Therefore, no routine monitoring for this standard is proposed.

F) Condition I.10. Ambient and Forage Fluoride Standards and Monitoring:

Order No. 02AQIS-3459 describes prior monitoring and modeling of ambient and forage fluoride near the plant. Based on the findings stated in the order, ambient fluoride standards are consistently met and no monitoring is required, as long as gaseous fluoride emissions from the facility have not exceeded 327 lbs/day at any time during the preceding 12 month period. Based on the findings stated in the order, forage standards are consistently met and no monitoring is required, as long as an annual vegetation survey is conducted and a survey is conducted to certify that no livestock is raised for commercial production within a five mile radius of the plant. The requirements of this order are state only conditions in the permit.

G) Conditions for other parameters not required by MACT :

Condition A.1. Benzene plus toluene are limited to a combined total of 1 ppm from the green mill liquid pitch vent (67 A). The emissions from the liquid pitch tank are treated by an oil scrubber followed by a charcoal filter. Either unit has the capability of reducing emissions below the 1 ppm limit. The charcoal filter is capable of operating for a year without maintenance but Alcoa procedures require that it be checked every six months. The scrubber system operation is checked weekly and corrective action is taken if the pressure on the liquid pitch pump falls outside an operating range of 70-100 pounds. Source tests have shown emissions to be in compliance. The average combined emissions of benzene and toluene were less than half the standard (Appendix C). Weekly inspections and observation of operating parameters in condition A.3 constitute periodic monitoring for this emission unit and further source testing is not necessary.

Condition A.4. VOC from the liquid pitch scrubber vent is limited to 1 ppm above background levels. Tests at 174 points showed no exceedances. Testing annually or upon Ecology's request is adequate periodic monitoring for this unit.

Condition A.7. MACT established the dry coke scrubber as preferred technology for control of POMs from the green mill. Ecology added a POMs emission standard of 0.70 lb/hr when approving the notice of construction for the dry scrubber Source tests have shown emissions to be less than 40% of the allowable. The source test required every 5 years and the MACT requirements for parametric monitoring specified in condition A.12, fulfill the requirement for periodic monitoring for POMs.

H) Condition D.2. Potroom Operation & Maintenance:

WAC 173-415-030(6) requires owners and operators to operate and maintain facilities and equipment in a manner consistent with good air pollution control practice. WAC 173-415-030(1)(b) requires owners and operators of center worked prebake pots to design the primary emission control system "so that the control of fluoride emissions will be equivalent to a total fluroide collection efficiency of ninety five percent". Potroom practices and integrity of pot shields are the major factors determining collection efficiency. Further, once pot gasses are collected, the alumina dry scrubber systems are very effective in removing fluoride and particulates. Except during startup, secondary emissions monitoring will be the sole monitoring requirement for potroom O&M if emissions do not exceed 1.7 lbs TF/ton of aluminum produced. This level is below the 1.9 lbs TF/T aluminum produces, required by MACT. This is 10% below the MACT level which was based on the the emissions of the best operating plants. In addition, Alcoa has demonstrated that in order to achieve the 1.7 lbs TF/ton standard, they must consistently maintain a collection efficiency of greater than 95%. Due to Alcoa Wenatchee Works' good operating record and early compliance with

MACT standards, Ecology has determined that more prescriptive O&M requirements, such as ongoing monitoring of collection efficiency, are not necessary to assure good O&M at this facility. If 1.7 lbs/ton is exceeded, additional monitoring and action is required. Actions required include a root cause analysis for the first exceedence and weekly inspections of potroom operations for the second exceedence. If 1.7 lbs TF/ton is exceeded more than 6 times, the company will be considered out of compliance with the O & M requirement of Condition D.2. Because roof emissions are monitored using a Method 14 manifold only in Rooms 6 and 20 and by continuous emissions monitors (CEMs) in all potrooms, determination of secondary emissions would be determined by correlation between Method 14 data and CEM data.

During startup, the provisions of the Startup Shutdown and Malfunction (SSM) plan will apply.

I) MACT

In October, 1997, USEPA promulgated National Emission Standards for Hazardous Air Pollutants (NESHAPS) representing Maximum Achievable Control Technology (MACT) for the primary aluminum industry. These rules are contained in the Code of Federal Regulations at 40CFR Part 63, Subchapter LL. Hazardous air pollutants (HAPs) for this industry include total fluoride (TF) and polycyclic organic matter, (POM).

The MACT standards for primary aluminum were subcategorized into major process areas (potlines, paste plants, and bake ovens) that produce emissions of either or both of these HAPs. Potlines were further subcataegorized by the type of reduction cell employed. Alcoa Wenatchee Works is listed in the federal regulations as being within the center-worked prebake one (CWPB1) subcategory.

In prebake plants, including CWPB1 plants, potlines produce fluoride in both gaseous and particulate form. Total fluoride standards address both gaseous and particulate forms of fluoride. MACT standards for prebake potlines address only total fluoride because POMs are driven off from the anode material during the anode baking process and are not of concern in prebake plant potline emissions.. Paste production plants (or “green mill” as it is known at Alcoa Wenatchee Works), produce POM emissions but fluoride emissions are not significant. Incoming coal tar pitch, used to manufacture green anodes, contains substantial quantities of volatile polycyclic hydrocarbons which escape during the melting, mixing and pressing processes within the carbon plant. MACT standards for paste plants require a specific technology for POM emission control. Dry coke scrubbers are the preferred technology although other technologies may be used if equivalency is demonstrated. Alcoa Wenatchee Works has already installed a dry coke scrubber. Numerical POM limits are not included in the MACT standards. Anode bake ovens produce both fluoride and POM emissions. At Alcoa

Wenatchee Works, these are collected and treated in an existing dry alumina scrubber system.

Alcoa Wenatchee Works has taken a proactive approach to implementing MACT requirements and are in compliance with MACT emission standards. Ecology has included the MACT requirements in the Draft Air Operating Permit.

On March 23, 2000, the USEPA promulgated National Emission Standards for Hazardous Air Pollutants (NESHAPS) representing Maximum Achievable Control Technology (MACT) for the secondary aluminum industry. These rules are contained in the Code of Federal Regulations at 40 CFR Part 63, Subpart RRR. Hazardous air pollutants (HAPs) for this industry include organic HAPs, inorganic gaseous HAPs (hydrogen chloride, hydrogen fluoride and chlorine) and particulate HAP metals. These MACT standards apply to secondary aluminum production facilities using clean charge, aluminum scrap, foundry returns or molten metal as the raw material and performing, among other things, one or more of the following processes: furnace operations such as melting, holding, refining, fluxing or alloying; in-line fluxing; or dross cooling.

The facility was required to demonstrate compliance with the secondary MACT requirements for the existing sources by March 24, 2003. Due to the plant curtailment, data from sister Alcoa plants with similar operations was used to preliminarily demonstrate the capability to meet the compliance requirements. The facility will have 180 days after start-up to complete compliance testing. The facility must be in compliance at start-up.

J) Insignificant Emission Units

Monitoring, recordkeeping, and reporting has not specifically been required by Ecology for insignificant emission units per WAC 173-401-530(2)(c). Therefore no monitoring, recordkeeping, or reporting requirements for insignificant emission units are included in the permit. In the event that monitoring, recordkeeping, and reporting requirements are imposed pursuant to WAC 173-401-530, an IEU would no longer qualify for the exemption from operating permit testing, monitoring, reporting and recordkeeping requirements.

K) Corrective Action

There is a requirement to initiate corrective action in many conditions of the permit. Initiating corrective action can include, but is not limited to, preparing a work order, ordering parts, shutting down the unit, or completing the repair.

APPENDIX A

ORDERS

Orders applicable to Alcoa Wenatchee Works include:

02AQIS-3459

APPENDIX B

PROCESS	EMISSION SUBJECT TO SPECIFIC REQUIREMENTS IN ADDITION TO GENERALLY APPLICABLE REQUIREMENTS	EMISSION UNITS SUBJECT TO ONLY GENERALLY APPLICABLE REQUIREMENTS	IEUs
Green Mill, Process #2	GM – 3 Pitch Storage Tank Scrubber	GM – 5B Bldg. 52 Coke Storage	GM – 1 Pitch Railcar Unloading
	GM -17 Dry Coke Scrubber which includes: GM – 13 Mixer Vents 1, 2, 3, 4, 5, 6, 7, 8, & 9; GM – 14 Conveyor beneath Mixers; GM – 15 Conveyor to Anode Forming; and GM – 16 Anode Forming	GM – 6 Green Anode Reject Storage	GM – 2 Pitch Tank Relief Valve
		GM – 7 Butt Storage	GM – 4 Hot Oil Boiler, Storage Tank, & Pumps
			GM – 9 Ball Mill Baghouse
	GM – 10 Bldg. 54 – Dust collector for Coke Storage	***GM – 8 Skipped Number***	GM – 5A Railcar Coke Unloading
			GM – 11 DS8 Coke Fines Baghouse
			GM – 12 M2 Coke Scales Baghouse
			GM –18 bldg 55 DC
Anode Baking, Process #3			BF – 1 Anode Storage Lanes
			BF – 2 Anode Transfer to Furnace
	BF – 10 A446 Reactor # 1 Stacks (BF – 4 Anode Bake)		BF – 14 446M Alumina Storage Baghouse
	BF – 11 A446 Reactor # 2 Stacks (BF – 4 Anode Bake)		BF – 8 Bldg. 58 Baghouse for Anode Cleaning
	BF – 12 A446 Reactor # 3 Stacks (BF – 4 Anode Bake)		BF – 9 Bldg. 62 Baghouse for Anode Cleaning and Kempe Machine
	BF – 13 A446 Reactor # 4 Stacks (BF – 4 Anode Bake)		
			AA – 1 Anode Stub Hole Vacuum
Anode Assembly/Rodding, Process #4			AA – 2 Iron Induction Furnace
	AA – 3 Butt Crusher Baghouse		AA – 5 Rod Straightening Press No. 1
	AA – 4 Butt Blast Baghouse		AA – 7 Magnetic Separator
			AA – 9 Welded Stub Repair/Replacement and Portable Welding Filter
			AA – 8 Butt Tank Baghouse
	AA – 10 Anode Cleaning 32T Baghouse		
	AA – 11 Induction Furnace Baghouse which includes: AA – 12 Iron Induction Furnace and AA – 13 Rod Brushing		
Potlines, Process #5	**PL – 0 Potroom Roof Vents which include:** PL – 1 Anode Insertion and Repositioning; PL – 2 Bath Material Addition: PL – 3 Alumina Hopper Filling Stations and Pot Alumina Addition; PL – 4 Pot Tapping; PL – 5 Anode Setting; PL – 6 Bath Crust Breaking; PL – 7 Aluminum Tapping; PL – 8 Bath Tapping; PC – 1 Water Cooling of Pots; PC – 2 Bath Material to Bath Recycle; PC – 3 Spent Potliner Removal; PC – 10 New Pot Start-up;		PL – 9 Floor Sweepings

PROCESS	EMISSION SUBJECT TO SPECIFIC REQUIREMENTS IN ADDITION TO GENERALLY APPLICABLE REQUIREMENTS	EMISSION UNITS SUBJECT TO ONLY GENERALLY APPLICABLE REQUIREMENTS	IEUs
	PR – 1,2,3 A398 Reactor for Lines 1, 2, and 3 which includes: PL – 12 Pot Fumes from Lines 1,2, and 3 and PC – 11 Fugitives from Pot Bake-in		
	PR – 4 A398 Reactor for Line 4 which includes: PL – 11 Pot Fumes from Line 4 and PC – 11 Fugitives from Pot Bake-in		
	PR – 5 Dry Scrubber for Line 5 which includes: PL – 10 Pot Fumes from Line 5 and PC – 11 Fugitives from Pot Bake		
	CC – 1 Crucible Cleaning Machine Baghouse		
Pot Rebuild, Process #6	SPL – 1 SPL Processing Baghouse – Bldg. 52M		CM – 1 Railcar Coal Unloading
			CM – 2 Kent Mill Baghouse for Coal Grinding, Storage, Sizing, Mixing, and Weighing
			CM – 3 Railcar Seam Mix Pitch Unloading
			CM – 4 Pitch Seam Mix Storage Tank
			CM – 5 Potliner Mixer Baghouse for Coal and Pitch Mixer
			CM – 6 Seam Mix Transfer
			CM – 7 Seam Mix Pitch Weighing
Boiler House, Process #7	BH – 1 Natural Gas Boiler # 1		BH – 3 Condensate Return Tank
	BH – 2 Natural Gas Boiler # 2		BH – 4 Steam Vents on Boilerhouse Roof
Ingot Plant, Process #8	IP – 1 Furnace 1 Exhaust	IP – 5 "C" Machine Treatment Unit	IP – 6 "C" Machine Pour and Skim
	IP – 2 Furnace 2 Exhaust	IP – 8 Crucible Heaters (Natural Gas Burn)	IP – 7 "C" Machine Cooling
	IP – 3 Furnace 3 Exhaust	IP – 10 "A" Machine Natural Gas Preheat	IP – 9 "A" Aluminum Pour and Skim
	IP – 4 Furnace 4 Exhaust	IP – 15 Free-standing Mold Heaters	IP – 13 "A" Water Cooling, North Stack
	IP – 11 Furnace 11 Exhaust	IP – 17 "D" Machine Natural Gas Preheat	IP – 14 "A" Water Cooling, South Stack
	IP – 12 Furnace 5 & 6 Exhaust	***IP – 18 Skipped Number***	IP – 16 Skipped Number
		IP – 21 "D" Machine Treatment Unit	IP – 19 "D" Machine Pour and Skim
		IP – 22 Skipped Number	IP – 20 "D" Cooling Fan
		IP – 26 Crucible Heaters (Natural Gas Burn)	IP – 23 Skipped Number
			IP – 24 Skipped Number
			IP – 25 Dross Cooling
			IP – 27 "A" Machine Mold Cooling Spray
			IP – 28 "C" Machine Mold Cooling Spray
			IP – 29 "C" Machine Ingot Cooling Spray
			IP – 30 Aspirated Mold Coating
			IP – 31"D" Machine Mold Cooling Spray
			IP – 32 Dross Storage Room

PROCESS	EMISSION SUBJECT TO SPECIFIC REQUIREMENTS IN ADDITION TO GENERALLY APPLICABLE REQUIREMENTS	EMISSION UNITS SUBJECT TO ONLY GENERALLY APPLICABLE REQUIREMENTS	IEUs
Maintenance Plant, Process #9			BS – 1 Mixer
			MS – 2 Plasma Torch Vent
			FF – 1 Machining Evacuation Vent
			FF – 2 Parts Cleaning Window Vent
			FF – 3 New Machining Evacuation Vent
			FF – 4 Metal Saw Evacuation Vent
			FF – 5 Steam Cleaning
			FF – 6 Blacksmith's Gas-fired Forge
			FF – 7 Grinder with Dry Filter
			FF – 8 Electrician's Work Area Vent
			FF – 9 Welding, Machining Evacuation Vent
Maintenance Plant, Process #9 (cont.)			FF – 10 Machining Evacuation Vent
			FF – 11 Welding Window Vent
			FF – 12 25 Safe-T-Kleen Stations
			FF – 13 Metal Sawing Evacuation Vent
			FF – 14 Preheat Furnace
			FF – 15 Sander with Dry Filter
			FF – 16 Saw with Dry Filter
			AS – 1 Auto Tailpipe Hose
			AS – 2 Steam Cleaner
			CS – 1 Wood Cutting
			CS – 2 Paint Booth with Dry Filters
			CS – 3 Wood Sanding
Ore Handling, Process #10	OH – 2 43E Baghouse for Alumina Railcar Unloading, Conveyor 41, Bldg. 43D		OH – 1 43M
	OH – 15 161-730 Dust Collector for Tanks A160 W and E		OH – 3 43R Dust Collector for Tank 43R
			OH – 6 160T-710 Dust Collector for Tank 160T-B
			OH – 7 160T-720 Dust Collector for Airslide ASO42-1
			OH – 8 160T-730 Dust Collector for Tank 160T-A
			OH – 9 160M-720 Dust Collector for Airslide AS-160T-1
			OH – 10 160M-720, Dust Collector for AS 160M and F (Airslides)
			OH – 11 160R-710 Dust Collector for Tank 160R

PROCESS	EMISSION SUBJECT TO SPECIFIC REQUIREMENTS IN ADDITION TO GENERALLY APPLICABLE REQUIREMENTS	EMISSION UNITS SUBJECT TO ONLY GENERALLY APPLICABLE REQUIREMENTS	IEUs
			OH – 12 160R-720 Dust Collector for AS 160R (Airslides)
			OH – 13 161-710 Dust Collector for 160RN, 161, and 162
			OH – 14 161-720 Dust Collector for AS 163RE and 160RN (Airslides)
			OH – 18 21RDust Collector for Tank 21M and Airslide AS-042-1
			OH-19 21 R Dust Collector for 21R tank north
			OH – 20 19A Dust Collector for Airslide AS-19M-2
			OH – 21 19C Dust Collector for Tank 19C
			OH – 22 19MS Dust Collector for Tank 19MS
			OH – 24,25,26,27,28 42A710-E Dust Collector for Airslide AS-042-2
			OH – 29 19T-710 Dust Collector for Tank AL 19T, Airslides AS19C-1 and AS19C-2
			OH – 30 19T-720 Dust Collector for Tank AL 19T
			OH – 31 19T-730 Dust Collector for Airslides AS19T-1 and 19T-3
			OH – 32 17R Dust Collector for Tank 17R
			OH – 42 21R (Center) Dust Collector
			OH – 43 21R (South) Dust Collector
	OH-45 5 D DC		
	OH-46 9 D DC		
	BR –1 40A (Bath Crusher) Dust Collector for Bath Storage and Conveyor, Mill Hopper, Conveyor 41, Rotary Breaker, and Tanks A-E		
			BR-2 Bath Recovery Transfer System

APPENDIX C

DATA TABLES

ALCOA Wenatchee Sampling Results NOC

* (dscfm * 60 * gr / dscf * 0.000143)

** ((dscfm * 60 * hours * gr / dscf * 0.000143 * 52) / 2000)

*** ((dscfm * 60 * 168 * gr / dscf * 0.000143 * 52) / 2000)

DE 91-AQI130   Liquid Pitch Facility   Vent (67A)   AOP ID   GM-03

		Emission Conc. In micrograms / M 3					Emission Conc. In ppm				Combined	Limit
EMISSION	**DATE**	RUN 1	RUN 2	RUN 3	**Average**		RUN 1	RUN 2	RUN 3	**Average**	**Average**	**ppm**
Benzene	**Sep-96**	182	80	76	**112.67**		0.052	0.023	0.022	**0.032**		
Toluene	**Sep-96**	142	50	47	**79.67**		0.035	0.012	0.011	**0.019**	**0.052**	**1**
Method 21	**Sep-96**	**0**	**0**	**0**		**Method 21 VOC leaks from 165 points One point above 1 ppm @ 4 ppm**						
		Emission Conc. In micrograms / M 3					Emission Conc. In ppm				**Combined**	**Limit**
EMISSION	**DATE**	RUN 1	RUN 2	RUN 3	**Average**		RUN 1	RUN 2	RUN 3	**Average**	**Average**	**ppm**
Benzene	**Nov-00**	22	22	23	**22.33**		0.006	0.006	0.007	**0.006**		
Toluene	**Nov-00**	27	28	29	**28.00**		0.007	0.007	0.007	**0.007**	**0.013**	**1**
Method 21	**Nov-00**	**0**	**0**	**0**		**Method 21 VOC leaks from 174 points none above 1 ppm**						
	Dec-01					**Method 21 VOC leaks from 203 points one point above 1 ppm @ 22.7 ppm**						

DE 97-AQI067   Dry Coke Scrubber Baghouse   54HDC   **AOP ID   GM-17**

EMISSION	**DATE**	**RUN 1**	**RUN 2**	**RUN 3**	**RUN 4**	**Avg. gr/dscf**	**Measured Avg. dscf/min**	**Weekly Est. Hours of Operation**	***Testing Results Lbs./Hr**	**NOC Limit tons / yr**	**** Actual Emissions tons / yr**	***** Emissions if Operated Full Time tons / yr**
Particulate	**May 99**	0.0005	0.0008	0.0005	0.0003	**0.0005**	**37784**	**112**	**0.168**		**0.496**	**0.743**
	Dec. 00	0.0001	0.0001	0.0002		**0.0001**	**51040**	**112**	**0.055**		**0.000**	**0.000**
	Nov. 01	0.0005	0.0005	0.0004		**0.0005**	**48940**	**112**	**0.194**		**0.611**	**0.917**
POM's	**May 99**	0.0003	0.0007	0.0002	0.0003	**0.0004**	**37784**	**112**	**0.127**		**0.354**	**0.531**
	Dec. 00	0.0006	0.0007	0.0005		**0.0006**	**51040**	**112**	**0.266**		**0.765**	**1.148**
	Nov. 01	0.0005	0.0006	0.0004		**0.0005**	**48940**	**112**	**0.198**		**0.611**	**0.917**
PAH's	**May 99**	0.0000086	0.000086	0.0000015	0.000006	**0.000026**	**37784**	**112**	**0.0083**		**0.024**	**0.036**
	Dec. 00	0.000012	0.000045	0.00000		**0.000019**	**51040**	**112**	**0.0101**		**0.024**	**0.036**
	Nov. 01	0.0000029	0.0000851	0.0000017		0.0000299	**48940**	**112**	**0.0125**		**0.037**	**0.055**

DE 91-1064   Lectromelt / Induction Funace Baghouse   **AOP ID   AA-11**

EMISSION	**DATE**	**RUN 1**	**RUN 2**	**RUN 3**	**RUN 4**	**Avg. gr/dscf**	**Measured Avg. dscf/min**	**Weekly Est. Hours of Operation**	***Testing Results Lbs./Hr**	**NOC Limit tons / yr**	**** Actual Emissions tons / yr**	***** Emissions if Operated Full Time tons / yr**
Particulate	**Aug. 91**	0.0046	0.0041	0.0036		**0.0041**	**7285.8**	**84**	**0.256**	**1.8**	**0.560**	**1.120**

ALCOA Wenatchee Sampling Results NOC

DE91-AQ1079 Butt Cleaning Baghouse — **AOP ID AA-04**

EMISSION	DATE	RUN 1	RUN 2	RUN 3	RUN 4	Avg. gr/dscf	Measured Avg. dscf/min	Weekly Est. Hours of Operation	*Testing Results Lbs./Hr	NOC Limit tons / yr	** Actual Emissions tons / yr	*** Emissions if Operated Full Time tons / yr
Particulate	Feb. 93	0.0002	0.0002			0.0002	4549.9	84	0.008	0.9	0.017	0.033

DE 91-AQ1079 Impactor Baghouse — **AOP ID AA-03**

EMISSION	DATE	RUN 1	RUN 2	RUN 3	RUN 4	Avg. gr/dscf	Measured Avg. dscf/min	Weekly Est. Hours of Operation	*Testing Results Lbs./Hr	NOC Limit tons / yr	** Actual Emissions tons / yr	*** Emissions if Operated Full Time tons / yr
Particulate	Mar. 93	0.00006	0.00143			0.00074	11803.4	84	0.075	2.4	0.165	0.329

DE 97-AQI099 Spent Anode Cleaning Baghouse 32TDC — **AOP ID AA-10**

EMISSION	DATE	RUN 1	RUN 2	RUN 3	RUN 4	Avg. gr/dscf	Measured Avg. dscf/min	Weekly Est. Hours of Operation	*Testing Results Lbs./Hr	NOC Limit tons / yr	** Actual Emissions tons / yr	*** Emissions if Operated Full Time tons / yr
Particulate	Jan. 00	0.0003	0.0003	0.0004		0.0003	57489	84	0.165		0.359	0.718
	Jun. 01	0.0001	0.0002	0.0002		0.0002	46325	84	0.071		0.145	0.289

DE 99-AQI022 Baghouse Potline 5 GTC — **AOP ID PR-05**

EMISSION	DATE	RUN 1	RUN 2	RUN 3	RUN 4	Avg. gr/dscf	Measured Avg. dscf/min	Weekly Est. Hours of Operation	*Testing Results Lbs./Hr	NOC Limit tons / yr	** Actual Emissions tons / yr	*** Emissions if Operated Full Time tons / yr
Particulate	Jan. 01	0.0016	0.0015			0.0016	392474	168	5.25		22.799	22.799
	Apr. 01	0.0029	0.0057			0.0043	367341	168	13.58		59.198	59.198
	May 01	0.0043	0.0043	0.0032		0.0039	374817	168	12.64		55.252	55.252
	Jun. 01	0.0029	0.0033	0.0025		0.0029	380250	168	9.46		41.327	41.327

DE 97-AQI038 Crucible Cleaning Baghouse 34LDC — **AOP ID CC-01**

EMISSION	DATE	RUN 1	RUN 2	RUN 3	RUN 4	Avg. gr/dscf	Measured Avg. dscf/min	Weekly Est. Hours of Operation	*Testing Results Lbs./Hr	NOC Limit tons / yr	** Actual Emissions tons / yr	*** Emissions if Operated Full Time tons / yr
Particulate	Oct. 98	0.0002	0.0002	0.0002		0.0002	19608	84	0.033		0.073	0.147
	Dec. 99	0.0003	0.0003	0.0001		0.0002	40011	84	0.078		0.175	0.350
	Dec. 00	0.0002	0.0003	0.0004		0.0003	20141	84	0.056		0.113	0.226
	Jun. 01	0.0001	0.0000	0.0001		0.00007	18064	84	0.010		0.023	0.045

ALCOA Wenatchee Sampling Results NOC

DE 96-AQI062 SPL Handling and Storage Baghouse 52MDC — **AOP ID SPL-1**

EMISSION	DATE	RUN 1	RUN 2	RUN 3	RUN 4	Avg. gr/dscf	Measured Avg. dscf/min	Weekly Est. Hours of Operation	*Testing Results Lbs./Hr	NOC Limit tons / yr	** Actual Emissions tons / yr	*** Emissions if Operated Full Time tons / yr
Particulate	May 97	0.0010	0.0003	0.0004		0.0006	96012	40	0.471		0.485	2.039
	Jun. 98	0.0004	0.0008	0.0002		0.0005	88979	40	0.367		0.371	1.556
	Dec. 99	0.0007	0.0007	0.0001		0.0005	89672	40	0.399		0.400	1.680
	Jun. 00	0.0003	0.0002	0.0004		0.0003	78887	40	0.183		0.211	0.887
	Dec. 00	0.0004	0.0005	0.0003		0.0004	93546	40	0.317		0.334	1.402
	Aug. 01	0.0003	0.0002	0.0003		0.0003	80471	40	0.189		0.191	0.804
Fluoride	May 97	0.00007	0.00005	0.00005		0.00006	94751	40	0.045		0.048	0.201
	Jun. 98	0.00002	0.00007	0.00003		0.00004	90531	40	0.029		0.032	0.136
	Dec. 99	0.00003	0.00001	0.000007		0.00002	83499	40	0.010		0.012	0.049
	Jun. 00		PARTICULATE ONLY					40				0.000
	Dec. 00	0.00004	0.00002	0.00003		0.00003	91842	40	0.023		0.025	0.103
	Aug. 01	0.00003	0.00002	0.00003		0.00003	80471	40	0.018		0.019	0.080
Cyanide	May 97	0.00003	0.00003	0.00006		0.00004	94751	40	0.034		0.034	0.142
	Jun. 98	0.00002	0.00002	0.00004		0.00003	90531	40	0.020		0.022	0.090
	Dec. 99	0.00002	0.00003	0.00004		0.00003	83499	40	0.021		0.022	0.094
	Jun. 00		PARTICULATE ONLY					40				0.000
	Dec. 00	0.00005	0.00005	0.00005		0.00005	91842	40	0.036		0.041	0.172
	Aug. 01		N/A					40				0.000
Ammonia	May 97	0.0000006	0.00018	0.00015		0.00011	96012	40	0.092		0.094	0.397
	Jun. 98	0.00012	0.00009	0.00003		0.00008	88979	40	0.063		0.064	0.267
	Dec. 99	0.0002	0.0005	0.0002		0.0003	89672	40	0.199		0.240	1.008
	Jun. 00		PARTICULATE ONLY					40				0.000
	Dec. 00	0.0003	0.0006	0.0004		0.0004	93546	40	0.338		0.362	1.519
	Aug. 01		N/A					40				

^ (dscfm * 60 * gr / dscf * 0.000143)
^^ ((dscfm * 60 * hours * gr / dscf * 0.000143 * 52) / 2000)

dscfm = Stack Volume in dscfm
60 = minutes to hour
hours = weekly average hours of operation
gr / dscf = concentration of emission
0.000143 = conversion gr to lbs
52 = weeks per year
2000 = convert lbs to tons